

Bauers Family Tree Farms News

A Semi-Annual Newsletter

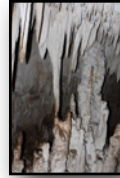
Issue N° - 13 September 2013

Farm Update



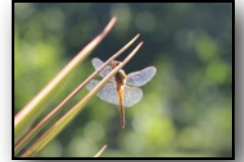
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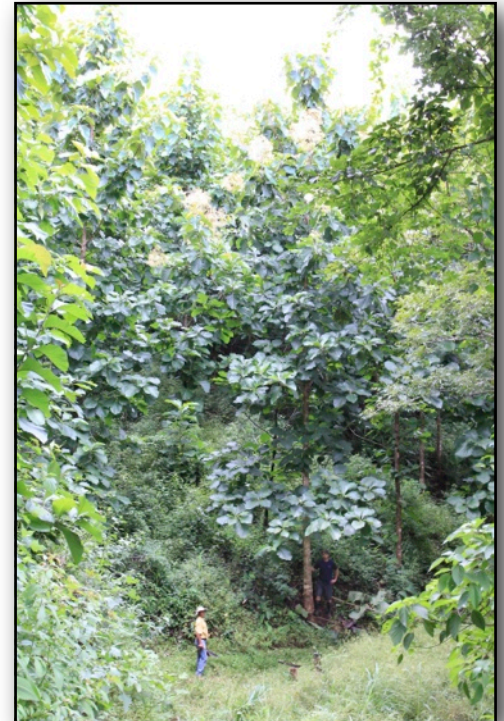
Unlike last year's rainy season, which brought only a modest amount of rain to the teak trees on the farm, the 2013 rainy season has, so far, endowed the trees with hefty amounts of rain. Residents in the area have reported heavy rains almost every day since the start of the rainy season in mid-May. The teak trees, as well



as the rest of the vegetation around the farm, reflect the steady rainfall and other favorable growing conditions.

This is the seventh growing season for the teak trees and the trees have taken on some more mature characteristics as compared to the first six years of their lives. One of the most noticeable differences is that the trees have really branched out as well as become stouter. For the first six years the teak trees grew nearly vertically and produced limited branches. This year the trees are not only growing more in height, but they have also grown many more branches and have really started to shade out the undergrowth. As we reported last year many of the trees had started to flower. This year the change is even more noticeable and a large portion of the tree population is now flowering. Just like humans, teak trees start their reproductive process at a certain age. Teak trees flower in the middle of the rainy season (July through October) and begin dropping their seeds at the end of the rainy season (November through December). We expect that the teak trees will now continue to flower and produce seeds for the rest of their lives.

This year will be the first year where undergrowth no longer needs to be trimmed with machetes. The canopy produced by the crowning out of the trees shades the undergrowth and does not allow it to grow as quickly or as high as it used to. Also the size of the trees easily allows them to outgrow any smaller plants that needed to be trimmed before. A nice benefit is that undergrowth trimming will mainly not be necessary in future maintenance efforts and the plants that do continue to grow will act as barrier against soil erosion. A pruning was performed last year in order to keep the trees growing straight and tall.



This year the farm manager wanted the trees to have a full year of growth and girth building before the next trimming and therefore pruning of all lower branches is scheduled for around May 2014.

The growth of the trees is truly amazing. Many of the trees on the farm measure more than 30 inches in circumference with the larger ones around 45 inches circumference (That equates to 10" to 14" diameters for the trees). A good chunk of the trees have grown to well over 50 feet tall and they continue to actively grow taller. We are excited and encouraged by the growth we have seen from the early years of the trees lives.

Barra Honda National Park

We had the good fortune to visit Barra Honda national park as we made a trip to Costa Rica in August of 2013. The park is a short drive from Nicoya towards the Tempisque River and it consists of a flat top mountain that rises about 1,200 feet



above sea level. The mountain is made up of an old coral reef that was geologically lifted some 60 million years ago. Much of the mountain is made up of limestone from its history of being under the sea. The consistent and heavy rains in the area have, slowly over time, dissolved parts of mountain to form 42 different caves in the park. The deepest cave in the park is almost 900 feet below the ground at its deepest point and another cave has a straight drop of 100 feet from the small entrance on the a side of the mountain to the cave floor below. We took a tour of the Terciopelo cave (terciopelo translates to velvet in English) with great local guides that were there for safety and information. The cave entrance is a smaller hole in the side of the mountain not much more than 6 or 10 feet wide. If one were walking through the forest and unsus-

pectedly came upon it would be easy to pass it by as nothing more than a small hole, but much lies beyond the nondescript entrance. The cave starts with a sheer drop of almost 60 feet. Fortunately for us and other visitors an aluminum ladder has been fixed to rock making the entrance slightly less harrowing although the guides insist on a belay rope attached to harnesses for the climb down. Once at the bottom the majesty of the cave begins. The sunlight shining through the small cave mouth into the large cavern below creates a cylinder of light that looks like a spotlight from the theater. From there the cavern descend into several "rooms" filled with all sizes and shapes of stalagmites and stalactites. The variety of size, shape and texture that the constant dripping water over the calcium carbonate left from ancient sea creatures is truly amazing. After some exploring in and around the formations we moved on. The deepest part of the cave can be accessed down a second ladder accessed through a much much smaller hole. At the bottom of the ladder a smaller "room" is again filled remarkable formations and textures. Maybe more interesting than the formations and the bottom of the cave is the disconnection from the outside world. After a look around we turned off our headlamps and experienced a darkness and a quietness that is rarely experienced. Not a single drop of sunlight reaches the bottom of the cave and the only sounds to be heard are the occasional drip or trickle of water, a genuinely magical experience. After a great tour and great time inside the earth it was back up the ladders and out of the cave into the sunlight and tropical vegetation once again.



Nitrogen Fixing by Lightning

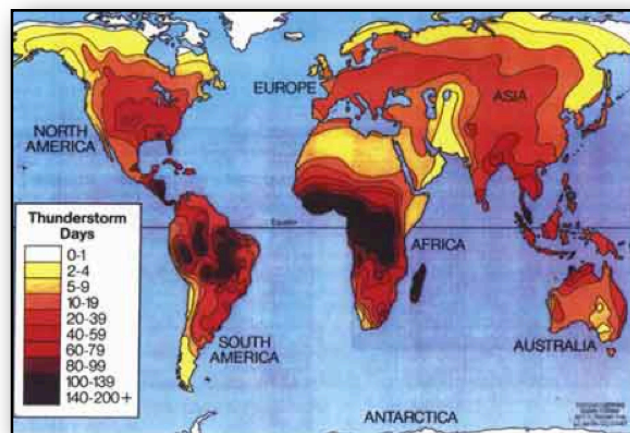


Have you ever noticed how things look just a bit greener and lusher the day after a big storm has rolled through? It is not just the added moisture that contributes to this. Actually it is the lighting that adds a nice dose of free fertilizer to the rainfall. As we all know nitrogen is an important and major part of plant fertilizer. Also nitrogen is abundant on Earth with about 78% of our atmosphere made up of the gas. Unfortunately plants can't simply adsorb nitrogen straight out of the atmosphere as the nitrogen in the atmosphere is a tightly bound molecule. So tight, in fact, that the gas is nearly inert. The tremendous power of lighting has the power

to breakdown nitrogen particles and convert them. This process called nitrogen fixation occurs by the nitrogen (N₂) being blown and then recombining with atmospheric oxygen (O₂) to form nitrogen oxides (NO). The nitrogen oxides are water soluble and as such will combine with the rain to form ammonia (NH₃) and nitrates (NO₃), which when brought to the ground by precipitation and readily usable by plants.

Lightning strikes the earth millions of times per day, which amounts to more than 3 billion strikes per year. Yet cloud to ground strikes make up only about 20% of all lightning. Cloud to cloud or in cloud lighting is much more prevalent. Lightning is not distributed evenly across the globe. As lightning is a byproduct of thunderstorms and thunderstorms result from the rapid upward movement of warm, moist air it is no surprise that the biggest concentrations of thunderstorms happen in the tropics where there is no shortage of heat and humidity.

All this bodes well for our trees down in the tropics as not only are we endowed with abundant water from the skies, but that water comes along with free fertilizer thanks to the molecu-



Global Thunderstorm days per year.

lar transformation caused by the lightning.

Thank You

Jake, Joe, Jaime

